THE SOCIAL MATRIX OF ADULT PHYSICAL ACTIVITY IN RHODE ISLAND

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Awareness of the health benefits associated with physical activity has experienced a recent upsurge in public health capital, stimulated by growing concern about the potential health fallout from a US obesity epidemic (cardiovascular disease, diabetes, cancer, and mental health issues).[1,2] Physical activity is instrumental in achieving "population health," broadly defined by the World Health Organization as: *"… a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."* [3]

The purpose of the present study is to describe the "societal matrix" (demographic, social, and economic) within which adult physical activity occurs, focusing on adult residents of Rhode Island who do not meet recommended guidelines for moderate physical activity, and building from past research on associations between physical activity and a) demographics factors such as age, sex, race and ethnicity, b) social factors such as marital status and presence of children, and c) economic factors such as employment, education, and household poverty.[4,5] Looking at physical activity in this way acknowledges its subtle grounding in the social construct commonly called "lifestyle," in contrast to approaches that look at physical activity as the fruit of specific, individual choices. The weaknesses of the latter are several, not the least of which is a tendency to stigmatize those who do not make "the right choices," blind to underlying societal matrix in which such choices are possible or impossible, nurtured or stifled.

METHODS

The **Behavioral Risk Factor Surveillance System (BRFSS)** is a national telephone survey of randomly selected non-institutionalized adults (ages 18 and older) who live in households with telephones. The BRFSS monitors the prevalence of behavioral risk factors that contribute to the leading causes of disease and death among adults in the United States. It is administered in all 50 states and four U.S. territories with funding and methodological specifications provided by the **Centers for Disease Control and Prevention (CDC).**[6] Two years' data, collected in

2001 and 2003, were combined. The resulting data set contained 8173 responses, of which 7627 were suitable for the present study, 4687 from females respondents, and 2940 from male respondents. Responses missing essential data were excluded from the analysis. (Table 1)

DEFINITIONS

Moderate physical activity is defined as physical activity of moderate intensity undertaken for 30 or more minutes per day, five or more days a week. This guideline may also be met by substituting physical activity of vigorous intensity undertaken for 20 minutes or more, three or more days a week.

Poverty is defined as family income below 200% of the federal poverty threshold.[7]

A multivariate logistic regression was performed to assess the strength of the relationship between physical activity and selected demographic, social, and economic variables. Crude and adjusted odds ratios were weighted to reflect the demographic structure of the Rhode Island adult population as closely as possible. Odds ratios were adjusted for the effect of each of the demographic socio-economic dimensions in the model and are discussed below. Ninety-five percent **confidence intervals (CI)** were calculated for the odds ratios using SUDAAN statistical software, version 9.0, which adjusts for the complex sampling design of the BRFSS.

RESULTS

In 2001 and 2003, 51% (CI: 50%, 52%) of adults aged 18 and older did not meet the national guidelines for moderate physical activity. The odds ratios for age, race / ethnicity, education, and employment are significantly associated with physical activity (after adjusting for other demographic, social, and economic variables), as follows:

· **AGE:** Relative to adults ages 18-34, (the referent group), older adults *had greater odds of not meeting guidelines* for moderate physical activity.

· **RACE / ETHNICITY:** Relative to non-Hispanic whites (the referent group), other groups *had greater odds of not*

meeting guidelines for moderate physical activity.

· **EDUCATION:** Relative to college graduates (the referent group), other groups *had greater odds of not meeting guidelines* for moderate physical activity.

· **EMPLOYMENT:** Relative to adults who "work for wages" (the referent group), other adults *had greater odds of not meeting guidelines* for moderate physical activity.

DISCUSSION

Consistent with a wealth of research, this analysis reveals a statistical relationship between dimensions of socio-economic status and physical activity, and furthermore, that these dimensions have *statistically independent effects* on meeting guidelines for moderate physical activity. One may infer that public health programs intended to promote physical activity had better address the "complex" of determinants inherent in "socio-economic status," rather than focusing on one or more particular barriers to physical activity, such as ignorance of its benefits to health.

What would a "holistic public health approach" look like? It would recognize the complex system of societal forces responsible for shaping "lifestyles" of which moderate physical activity is a part, and recognize, as well, that the system of societal forces is configured differently in separate social strata, resulting in different "lifestyles." It would set long term objectives for systemic changes within and across social strata. For example:

· Support all state and local interventions to improve the **quality of education** for Rhode Island youth, focusing on the state's six core cities. *(Rationale: Educational attainment is the sine qua non of all public health interventions, and is central to the complex social phenomenon to which we have referred as "lifestyle.")*

· Sustain and expand **public transportation** throughout the state, linking low income neighborhoods with other communities throughout the state, and providing a real public transportation option for the middle class commuter.

(Rationale: Reliable public transportation is foundational for education, employment, access to health care, and other societal resources associated with lifestyle. Substituting public transportation for the use of personal vehicles integrates moderate physical activity into "getting around.")

- Build additional **biking and walking paths**. *(Rationale: These trails are popular and well-used wherever they are built. They create new "community spaces" and nurture the adoption of new, healthy habits.)*

- Plan for **mixed income neighborhoods**. *(Rationale: Socially segregated low income neighborhoods have been consistently associated with unhealthy lifestyles, including low levels of physical activity.)*

- Promote economic planning that creates a **mix of jobs to suit existing skills** of the workforce. *(Rationale: Unemployment is a major, complex barrier to the development of healthy lifestyles, including appropriate levels of healthy physical activity. Developing only "high-tech" jobs with little opportunity for persons of low to moderate academic achievement leaves a substantial proportion of the population at risk of unemployment or underemployment.)*

REFERENCES

1. Burke G, Arnold A, et al. Factors associated with healthy aging. *J Amer Geriatr Soc* 2001; 49:254-62.
2. Paluska S, Schwenk T. Physical activity and mental health current concepts. *Sports Med* 2000; 29:167-80.
3. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, page 100) and entered into force on 7 April 1948.
4. Dowda M, Ainsworth B, et al. Correlates of physical activity among U.S. young adults, 18 to 30 years of age, from NHANES III. *Ann Behav Med* 2003; 26:15-23.
5. Estabrooks P, Lee R, Gyurcsik N. Resources for physical activity participation. *Annals Behav Med* 2003; 25:100-4.
6. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. http:/www.cdc.gov/brfss.
7. US.Census Bureau. http://www.census.gov/hhes/poverty/threshld.html.

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Table 1. Relationship between demographic socio-economic dimensions and not meeting guidelines for moderate physical activity among Rhode Island adults, RI BRFSS 2001, 2003.

Socio-demographic Dimension	At risk for not meeting recommended moderate physical activity guidelines			
	Unadjusted OR (OR)	95% CI	Adjusted OR (AOR)	95% CI
Sex				
Males	1.0	Referent	1.0	Referent
Females	1.2	1.1, 1.4	1.1	1.0, 1.3
Age				
18-34	1.0	Referent	1.0	Referent
35-49	1.2	1.0, 1.4	1.2	1.1, 1.5
50-64	1.7	1.4, 1.9	1.6	1.3, 2.0
65+	2.5	2.1, 3.0	2.3	1.6, 3.1
Race / Ethnicity				
White, NH	1.0	Referent	1.0	Referent
Black/AA, NH	1.8	1.3, 2.6	2.2	1.5, 3.1
Hispanic	1.9	1.5, 2.4	1.8	1.4, 2.4
Other	0.8	0.6, 1.2	1.1	0.8, 1.6
Education				
Less than HS	2.2	1.8, 2.6	1.4	1.1, 1.9
HS grad/GED	1.6	1.4, 1.8	1.3	1.1, 1.5
College/tec sch	1.1	1.0, 1.3	1.1	0.9, 1.3
Col.grad +	1.0	Referent	1.0	Referent
Employment				
Work for wages	1.0	Referent	1.0	Referent
Self employed	0.8	0.6, 1.0	0.7	0.6, 1.0
Not working	1.4	1.1, 1.8	1.2	0.9, 1.6
Homemaker/student	1.0	0.8, 1.2	0.9	0.7, 1.1
Retired	2.0	1.7, 2.3	1.0	0.8, 1.3
Unable to work	3.0	2.3, 4.1	2.4	1.7, 3.4
Poverty				
Below 200%	1.5	1.3, 1.7	1.1	0.9, 1.3
Above 200%	1.0	Referent	1.0	Referent
Marital Status				
Married	1.0	Referent	1.0	Referent
Divorced	1.0	0.9, 1.2	0.9	0.7, 1.1
Widowed	2.2	1.8, 2.7	1.3	1.0, 1.6
Separated	1.6	1.1, 2.3	1.0	0.7, 1.5
Never Married	0.8	0.7, 0.9	0.9	0.7, 1.0
Unmarried Couple	0.7	0.5, 0.9	0.7	0.5, 1.0
Children				
No children	1.0	Referent	1.0	Referent
1-2 children	0.8	0.7, 0.9	1.0	0.9, 1.2
3 children +	0.7	0.6, 0.9	0.8	0.6, 1.0

Data Source: Rhode Island Behavioral Risk Factor Survey, 2001 and 2003
OR: Odds ratio. AOR: Adjusted odds ratio. Adjusted for all factors listed in table CI: Confidence Interval
$P<.05$
Estimates are weighted to RI population .